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SECRET

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S E C R E T 201612Z DEC 68 CITE [REDACTED] 5317

ACTION COPY**3**SUBJECT: COMMENTARY ON EVALUATION OF POLARIZER FOR USE IN
OBLIQUE AERIAL PHOTOGRAPHY

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1. AS PER YOUR REQUEST, THE [REDACTED] REPORTS ON
POLARIZATION OF OBLIQUE AERIAL PHOTOGRAPHY AND THE ACCOMPANYING
SAMPLES WERE REVIEWED AND THE FOLLOWING CONCLUSIONS HAVE BEEN REACHED:

A. BOTH REPORTS (PART I AND PART II) ARE TECHNICALLY
VALID. ON PART II, THE IMAGERY EXPOSED THROUGH THE W12/POLARIZER
FILTERS PROVIDED SIGNIFICANT IMAGE ENHANCEMENT AS COMPARED TO
THAT EXPOSED THROUGHOUT THE W12 FILTER.

B. BOTH REPORTS HAVE VERY LITTLE IN COMMON WITH OPERATIONAL
SYSTEMS DUE TO CURRENT ACQUISITION ALTITUDES, I.E., EFFECTS OF
POLARIZATION AT 70,000 FEET ARE PROBABLY DIFFERENT THAN AT
LOWER ALTITUDES. ALSO THE [REDACTED] TEST WAS FLOWN WITH
AN AIR SPEED OF 85 KNOTS, OPERATIONAL SPEEDS ARE MUCH FASTER
(HENCE IMAGE MOTION COMPENSATION CONSIDERATIONS VARY).

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2. IT SHOULD, HOWEVER, BE RECOGNIZED THAT A POLARIZER FILTER
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REDUCES THE AMOUNT OF ENERGY (APPROXIMATELY 0.9 LOG EXPOSURE;
3 F/STOPS) REACHING THE RECORDING MATERIAL. TO COMPENSATE FOR THIS
REDUCTION, A FILM WITH A FASTER EMULSION SPEED MUST BE USED OR THE
EXPOSURE MUST BE INCREASED. EITHER OF THESE OPTIONS MAY RESULT IN
A LOSS OF GROUND RESOLUTION DUE TO THE INCREASED GRANULARITY OF
A FASTER FILM OR IMAGE SMEAR INTRODUCED THROUGH LONGER EXPOSURE.

3. POLARIZATION IS EFFECTIVE IF RIGIDLY COORDINATED WITH FLIGHT
AND EXPOSURE PARAMETERS, I.E., SOLAR ELEVATION AND AZIMUTH RELATIVE
TO CAMERA LOOK ANGLES, TYPE OF RADIATION, SCATTERING INVOLVED, ETC.

4. AS POINTED OUT IN REPORT NUMBER II, A POLARIZER IS HELPFUL
ON A HAZY DAY, BUT THE DEGREE OF IMPROVEMENT IS SLIGHT. POLARIZATION
IS MOST EFFECTIVE ON A CLEAR DAY.

5. A POLARIZER USED ON A CAMERA LOOKING AWAY FROM THE SUN, HAS
LITTLE OR NO EFFECT, THEREFORE, WHEN USING A POLARIZER ON A PANORAMIC
CAMERA FLYING PERPENDICULAR TO THE SUN'S AZIMUTH, A WIDE DENSITY
VARIATION ACROSS THE FORMAT WOULD PROBABLY EXIST.

6. IT MUST ALSO BE RECOGNIZED THAT IMAGE FORMING ENERGY IS
SOMETIMES POLARIZED TO THE EXTENT THAT THE POLARIZING FILTER WILL
CANCEL OUT OR OBSCURE IMAGERY.

7. IN VIEW OF THESE CONCLUSIONS, IT WOULD SEEM APPARENT THAT
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MUCH MORE TESTING IN THIS FIELD IS NEEDED. THE FEW REPORTS THAT
ARE AVAILABLE ARE ONLY APPLICABLE TO A GIVEN CIRCUMSTANCE.
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-END OF MSG-

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Declass Review by NGA/DOD

GROUP 1
Excluded from automatic
downgrading and
declassification

DATE
 23 DEC 1968

| ROUTING SLIP | | DATE | INITIAL |
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